792

Base
Station

Bluetooth™ RF
Transceiver Chipset

790

In RF
Range

Within RF
Communication
Range

Outside Of
RF-Range

791

Wireless
Reader

Bluetooth™ RF
Transceiver Chipset

FIG. 1A1

791

Wireless
Reader

Bluetooth™ RF
Transceiver Chipset

790

792

Base
Station

Bluetooth™ RF
Transceiver Chipset

In RF
Range

Within RF
Communication
Range

Outside Of
RF-Range

FIG. 1A2

1005B 1005A 1001
1004 1003
1002
Base
Station
1007
1008
1006A
1000
SYMBOL CHARACTER
DATA FLOW DURING
BARCODE SYMBOL
READING CYCLE OF
PRESENT INVENTION

1010

A

Wireless

1005B 1005A 1001
1004 1003
1002
Base
Station
1007
1008
1006B
1000
SYMBOL CHARACTER
DATA FLOW DURING
BARCODE SYMBOL
READING CYCLE OF
PRESENT INVENTION

1010

B

FIG. 1A3

New sheet

FIG. 1B

new sheet

FIG. 1C

New sheet

Base Station
804

Decoded Symbol Character Data

Laser-Based Bar Code Reading Subsystem
32

Laser-Based Bar Code Reading Field
38

Laser-Based Bar Code Reading Field

A_3

E_3, E_4

Laser-Based Bar Code Detection Subsystem
31

Laser-Based Bar Code Detection Field
37

Laser-Based Bar Code Detection Field

A_2

E_2

A_1

On/Off

Data Trans. Switch
35A

A_4

Data Transmission Subsystem
803
33

Control Subsystem
36

(E_5, E_6, E_7)

A_4

Mode-Select Sensor
35B

R Y G

Status Indicator Lights
34

30

FIG. 1D

61
44
49A
49
41
40
49B
55
51B
51D
43
51A
42
51C
46
47
Host (45)
To Power
Supply

FIG. 2A

49A
41
52A
50
52B
43

FIG. 2B

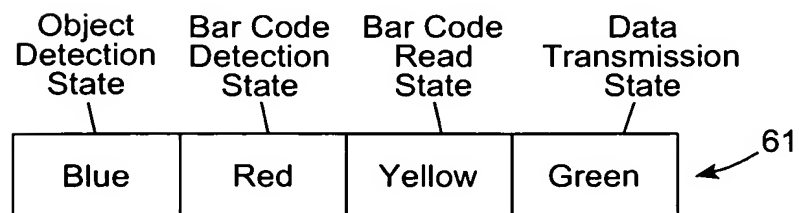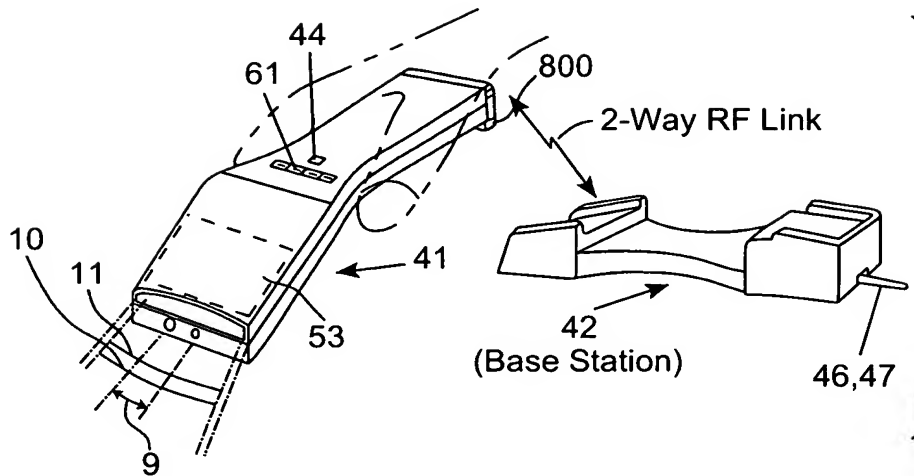| Object Detection State	Bar Code Detection State	Bar Code Read State	Data Transmission State	
Blue	Red	Yellow	Green	61

FIG. 2C

FIG. 2D

FIG. 2E

FIG. 2F

49A

41

49B

52A

2E

2E

800

IR-Based
Object Detection
Field (9)

Laser-Based
Bar Code Reading
Field (11)

Cusen-Based
Bar Code Detection
Field (10)

FIG. 2G

41

49B

49A

52A

44

61

Laser-Based
Bar Code Reading
Field (11)

IR-Based
Object Detection
Field (9)

Cusen-Based
Bar Code Detection
Field (10)

FIG. 2H

40'

41'

61

44

800

63

2-Way RF Link

49

53'

24

25

23

42
(Base Station)

46,47

FIG. 2I

40"

41"

61

44

800

63

2-Way RF Link

49

53"

37

38

42
(Base Station)

46,47

FIG. 2J

Base Station

Information Server

139

132

132

133

135

141

131

145'

137

145

136

134

145

144

2-Way
RF Link

53

138

9

11

130

10

138

FIG. 3A

Base Station

139

132

Internet
Server

133

135

132

141'

145'

137

145

136

134

145

2-Way
RF Link

144

138

53'

130'

23

24

25

138

FIG. 3B

Base Station

139

132

Internet
Server

133

804

135

132

140"

141"

2-Way
RF Link

145'

145

137

134

136

145

144

138

803

53"

130"

38

37

138

FIG. 3C

3-D LASER
SCAN FIELD
162

10

11

9

164

165

168

169

170

163

161A

53

161

151

155

161B

160

MODE-SELECT
SENSOR 650

150

152

153

154

RF Link

158

156

157

167

166

162

BASE STATION

FIG. 4A

170

168

163

161A

169

53'

23

161

25

151'

24

155

165

161B

160

154
RF

153

152

158

156

157

MODE-SELECT
SENSOR 650

150'

167

166

162

FIG. 4B

FIG. 4C

Automatic Bar Code Reading System With 2-Way RF Communication Link

791
330
790
792

FIG. 5A

791
Pin-Hole
Power Buton
(2000)
792

FIG. 5B

330
791
792

FIG. 5C

330
791
Pin-Hole
Power Buton
(2000)
792

FIG. 5D

Protracted Configuration

Vertical Mounting Surface

330

793

790

791

792

FIG. 5E

Protracted Configuration

330   793   790   791

792

FIG. 5F

Direct Electrical
Charging Contacts

792

In Retracted
Configuration
793

FIG. 5G

In Retracted
Configuration
793

792

FIG. 5H

Retracted Configuration
793

792

FIG. 5I

Projected Configuration
793

792

FIG. 5J

200

203

202B

201

202A

226

227

228

10 LASER-BASED
BAR CODE
DETECTION FIELD

11 LASER-BASED
BAR CODE
READING FIELD

9 IR - BASED OBJECT
DETECTION FIELD

F I G. 6A

New sheet

METROLOGIC ™

202B

210

204

226

206B

206A

203

225

202A

212

228

227

FIG. 6B

203

202B

200'

201

200

228

LASER-BASED
OBJECT DETECTION
FIELD (23)

202A

226

227

LASER-BASED
BAR CODE
DETECTION FIELD (2

LASER-BASED
BAR CODE
READING FIELD (25)

FIG. 6E

203

202B

200"

201

228

LASER-BASED
BAR CODE
DETECTION FIELD (37)

202A

226

227

LASER-BASED
BAR CODE
READING FIELD (38)

FIG. 6F

FIG. 7A

251

234

+y
-x   -z
+z   +x
-y

9

10

11

230

231B

231

231A

240

230

237

231B

231A

234   238

FIG. 7B

231B

230   231A

242

FIG. 7C

249   246   245   247   232

248   250

231B

+y
-x   -z
+z   +x
-y

26

242

238

234

236

238   236

237

231A

240

FIG. 7D

FIG. 7E

FIG. 7F

FIG. 8A

FIG. 8B

FIG. 8C

FIG. 9A

FIG. 9B

FIG. 10A1

New sheet

FIG. 10A2

New sheet

200,
230,
260,
270,
290

327B

328

329

VOLTAGE
REGULATOR

330

AUTO POWER
CONTROL
CIRCUIT

326

320

335

SYSTEM
OVERRIDE
SIGNAL
PRODUCING
MEANS

302

RC NETWORK

FIG. 10A3

New Shea

POWER DISTRIBUTION CIRCUITRY

325

RC NETWORK 305

RC NETWORK 312

C_3/C_1 2

DATA TRANSMISSION SWITCH

303

SCAN ENGINE

300

HOST DEVICE, I.E. COMPUTER, PDT, ECR, ECT.

441

$E_9=1$

DATA TRANSMISSION STATE INDICATOR

454

FIG. 10A4

FIG. 10B1

301

336

S-R LATCH

CLK 1

D_0

338

337

SET

RESET

A_0

339

340

SO DR

FIG. 10B2

302

V_{REF}

301A

342

343

V_1

CLK1

R_1 R.PER

V_1

344

345

R_2

V_2

C_1 R. DC

V_2

FIG. 10C

V_1 V_{TH}

V_{TL}

V_2

CLK 1

◄── PERIOD = 1 ms ──► ◄── PULSE WIDTH = 10 µs ─►

FIG. 10D

LIMITER

AMPLIFIER 355

IR REC

E_0

CLK 1

EIRT

357

V_0

SYNCHRONOUS TRANSRECEIVER CIRCUIT 356

307

A_1

IR DR

FIG. 10E

C_3/C_{1-1}

A_0

C_3/C_{1-2}

C_2/C_1

364

363

365

362

366

E_0

304

E_1

E_2

B1

RST

CLK

CLOCK
DEVIDE
CIRCUIT

373

CLK/2048

$V_{cc}/2$

372

376

370

V_{cc}

A_1

361

D   P   Q
         R

CLK

         C
         L

$\bar{Q}$

371

374

VX

T_1RC

C_1

DIGITAL TIMER CIRCUIT

FIG. 10F

FIG. 10G

$$E_0 = \overline{(B1 + A_0) (C_3 / C_{1-1})}$$

$$E_1 = (C_3 / C_{1-2}) + B1$$

$$E_2 = (C_2 / C_1) (T_1)$$

FIG. 10H

FIG. 10I

311

A_2

392 393 394 395

D_2

D PR Q | D PR Q | D PR Q | D PR Q
CLK C | CLK C | CLK C | CLK
L Q̄ | L Q̄ | L Q̄ | Q̄

390

E_2

397

391

RST

CLK/32

400

V_{CC}

398

D PR Q

$V_{CC}/2$

CLK C

CLOCK DIVIDE

RC BCD

CCT

401

L Q̄

399

402

T_{BCD} CIRCUIT

FIG. 10J

400A 400B 400C 400D

CLOCK

D PR Q | D PR Q | D PR Q | D PR Q
CLK C | CLK C | CLK C | CLK C
L Q̄ | L Q̄ | L Q̄ | L Q̄

RESET

400

D PR Q

400E

CLK C

L Q̄

CLK

FIG. 10K

FIG. 10L

FIG. 10M

C_3 / C_2	A_2	E_3	C_2 / C_1
0	0	0	0
0	1	1	0
1	X	1	1

X: DON'T CARE (I.E. C_3 / C_2 OVERRIDES A_2)

FIG. 10N

(Air Interface)

434

Bluetooth ® RF Transceiver Controller

4001

803

Bluetooth ® Baseband Controller

4002

321

CPU of System Controller

FIG. 10O

FIG. 11

42

560

573

572 HIGH PASS FILTER

571 DC CHOPPER CIRCUIT

574

563 BASE UNIT IDENTIFICATION NUMBER STORAGE (NDVRAM)

573 μP, RAM, ROM

571 DATA TRANSMISSION CIRCUIT

E_{DT}

MICRO-CONTROLLER

565 BASE UNIT CONTROLLER

A_7

E_{SB}

SERIAL DIGITAL DATA

E_{DFC}

570 DATA FORMAT CONVERSION MODULE

4002 BLUETOOTH BASEBAND CONTROLLER

4001 BLUETOOTH RF TRANSCEIVER MODULE

804

61

568 SYMBOL CHARACTER DATA EXTRACTION MODULE

564 DATA PACKET STORAGE BUFFER

DATA TRANSFER CABLE

576

45 TO HOST DEVICE

New sheet

PORTABLE
BARCODE
SYMBOL
READER

2-WAY
TRANSMISSION

BASE UNIT

DATA TO HOST SYSTEM

F I G. 12

792

Base
Station

Bluetooth™ RF
Transceiver Chipset

790

Within RF
Communication
Range

In RF
Range

Outside Of
RF-Range

791

Wireless
Reader

Bluetooth™ RF Chipset

FIG. 13A1

791

Wireless
Reader

Bluetooth™ RF
Transceiver Chipset

790

792

Base
Station

Bluetooth™ RF
Transceiver Chipset

Within RF
Communication
Range

In RF
Range

Outside Of
RF-Range

FIG. 13A2

DATA PACKET TRANSMISSION VIA 2-WAY RF WITH AUTOMATIC RF-RANGE DEPENDENT CONTROL

START

A

ACTIVATE SYSTEM OVERRIDE DETECTION **CKT**, FIRST CONTROL **CKT** C_1, OSCILLATION **CKT**, SYSTEM OVERRIDE SIGNAL PRODUCING MEANS, **IR** SENSING **CKT**, PHOTODETECTION **CKT**; DEACTIVATE STATUS DETECTION, **A/D** CONTROL **CKT**, CONTROL **CKT** C_2, BAR CODE DETECTION **CKT**, CONTROL MODULE C_3, SYMBOL DECODING MODULE, DATA PACKET SYSTEM MODULE, DATA PACKET TRANSMISSION MODULE; RESET ALL TIMERS TO **T = 0**, INITIALIZE DECODED SYMBOL DATA BUFFER; CLEAR $A_3 = 1$ FLAG

DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_0 = 1$?

NO

B

YES

C — C_1 ACTIVATES THE INFARED DETECTION CIRCUIT AND DRIVES OBJECT DETECTION STATE INDICATOR USING $E_0 = 1$

I I

NO

YES

IS $A_1 = 1$?

HH

DEACTIVATE LASER SCANNING MECHANISM

F I G. 14A1

D

DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_1 = 1$ INDICATING AN OBJECT IS DETECTED ?

NO

YES

E

DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_0 = 1$?

NO

YES

⑨

F

C_1 DEACTIVATES IR DETECTION CIRCUIT, IR TRANSMITTER, AND IR RECEIVER USING E_0; C_1 ALSO ACTIVATES SCANNING CIRCUIT, PHOTO-RECEIVING CIRCUIT, AND A/D CONVERSION CIRCUIT USING E_1, BARCODE PRESENCE DETECTION CIRCUIT USING E_2; AND STARTS TIMER T_1; AND DRIVES BAR CODE DETECTION STATE INDICATOR USING $E_2 = 1$

G

DOES SECOND CONTROL CIRCUIT C_2 RECEIVE CONTROL ACTIVATION SIGNAL $A_2 = 1$ INDICATING A BARCODE IS DETECTED WITHIN T_1 ?

NO

YES

③

H

IS $A_3 = 1$ FLAG SET TO "TRUE" ?

NO

YES

I

SET DATA IN SYMBOL DECODED DATA BUFFER TO ZERO

②

①

FIG. 14A2

② ①

J —

**C₂ ACTIVATES THIRD CONTROL CIRCUIT C₃ USING E₃;
C₂ ALSO RESETS TIMER T₁, 0 ≤ T₁ ≤ 1.0 sec**

K —

**C₃ ACTIVATES THE SYMBOL
DECODING MODULE USING E₄;
RESETS AND RESTARTS TIMER
T₂, 0 < T₂ < 1 sec; AND STARTS
TIMER T₃, 0 < T₃ < 5 sec.**

N —

**DOES
THIRD CONTROL
CIRCUIT C₃ DETECT TIME
ELAPSED ON TIMER
T₃ > 5 sec
?**

NO YES

YES

L —

**DOES
CONTROL MODULE
C₃ RECEIVE CONTROL
ACTIVATION SIGNAL
A₃ = 1 WITHIN T₂
?**

④ NO

M —

③

**DOES
CONTROL MODULE
C₃ RECEIVE CONTROL
ACTIVATION
SIGNAL A₂ = 1 ?**

NO

YES

**SET A₃ = 1 FLAG TO TRUE AND GENERATE
ENABLE SIGNAL E₈ TO DRIVE BAR CODE
READ STATE INDICATOR**

O —

**IS ELAPSED
TIME ON TIMER T₃ > 5.0
SECONDS ?**

YES

NO

P —

Q —

**DOES
CONTROL
MODULE C₃ RECEIVE
CONTROL ACTIVATION
SIGNAL A₄ = 1 WITHIN
60ms?**

NO

R —

**SET DATA IN
SYMBOL
DECODED DATA
BUFFER TO ZERO**

YES

⑤

FIG. 14B

New Sheet

FIG. 14C1

IS
ELAPSED
TIME ON
TIMER
$T_3 > 5.0$
sec.?   (U)

YES → (3)

NO → (4)

NO

IS DECODED
BAR CODE SYMBOL
DATA DIFFERENT FROM
BAR CODE SYMBOL DATA
IN SYMBOL DECODED
DATA BUFFER ?   (T)

YES

NO

IS DATA
IN SYMBOL
DECODED DATA
BUFFER SET TO
ZERO?   (S)

YES ← (5)

NO

YES

STORE SYMBOL CHARACTER
DATA IN SYMBOL DECODE DATA
BUFFER AND GENERATE
ENABLE SIGNAL $E_7=1$ TO DRIVE
DATA TRANSMISSION STATE
INDICATOR   (V)

→ (7)

(7)

THIRD CONTROL CIRCUIT C_3 CONTINUES ACTIVATION OF LASER DIODE, SCANNING MOTOR, PHOTORECEIVING CIRCUIT, **A/D** CONVERSION CIRCUIT; DEACTIVATES SYMBOL DECODING MODULE; AND COMMENCES ACTIVATION DATA PACKET SYNTHESIS MODULE — W

UNDER C_3 CONTROL DATA PACKET SYNTHESIS MODULE CONSTRUCTS DATA PACKET CONSISTING OF SYMBOL CHARACTER DATA, TRANSMITTER NUMBER, DATA PACKET GROUP NUMBER, CHECK CHARACTER AND FRAMING CHARACTERS — X

IS IN-RF RANGE CONFIRMATION SIGNAL $A_5=1$? — Y

NO → (10)

YES

ARE DATA PACKET GROUP(S) STORED IN DATA PACKET GROUP BUFFER? — Z

NO

YES

C_3 CONTROL MODULE GENERATES ENABLE SIGNAL $E_{11}=1$ RELOADING BUFFERED DATA PACKET GROUPS INTO DATA PACKET TRANSMISSION CIRCUIT — AA

CONTROL MODULE C_3 GENERATES ENABLE SIGNAL $E_{11}=1$ LOADING CURRENTLY SYNTHESIZES DATA PACKET GROUP INTO DATA PACKET TRANSMISSION CIRCUIT — BB

(11)

FIG. 14C2

(11)

C_3 ACTIVATES DATA PACKET TRANSMISSION CIRCUIT ⌐CC

UNDER C_3 CONTROL DATA PACKET SYNTHESIS MODULE OUTPUTS PACKETS TO DATA PACKET TRANSMISSION CIRCUIT FOR TRANSMISSION TO BASE STATION ⌐DD

DATA PACKET TRANSMISSION CIRCUIT RECEIVES A PACKET GROUP ACKNOWLEDGEMENT SIGNAL FROM BASE STATION WHEN BASE STATION RECEIVES ALL PACKETS IN EACH DATA PACKET GROUP SENT ⌐EE

C_3 CONTROL MODULE GENERATES AUDIBLE BEEP SOUND (AND GOOD READ VISUAL-INDICATION) FOR EACH DATA PACKET GROUP SENT TO BASE STATION SUCCESSFULLY ⌐FF

(8)

FIG. 14C3

⑧

GG

C_3 CONTINUES ACTIVATION OF SCANNING CIRCUIT, PHOTO-RECEIVING CIRCUIT USING C_3/C_1 OVERRIDE; DEACTIVATES SYMBOL DECODING MODULE USING E_4; DEACTIVATES THE DATA PACKET SYNTHESIS MODULE, DATA STORAGE UNIT, AND DATA TRANSMISSION CIRCUIT USING E_5, E_6 AND E_7 RESPECTIVELY; AND DISABLES DATA TRANSMISSION STATE INDICATOR USING $E_9=0$

HH

DOES THIRD CONTROL CIRCUIT C_3 CONTINUE TO RECEIVE CONTROL ACTIVATION SIGNAL $A_1=1$ INDICATING AN OBJECT IS PRESENT?

NO → ①

YES

II

CONTROL MODULE C_3 REACTIVATES BAR CODE PRESENCE DETECTION CIRCUIT USING C_3/C_2 OVERRIDE, RESETS AND RESTARTS TIMER T_4, $0 < T_4 < 3$ sec. AND STARTS TIMER T_3, $0 < T_3 < 5$ sec.

⑨

FIG. 14C4

FIG. 15

Host System

792

800

RF Communication Range

2-Way RF Communication Link

"Click, Click Click..."

791

Pin-Hole Power Off Button

Note: The User Enables Downward Scanning Movement During 2-D Bar Code

Reading Operation, And Device Generates Clicks Therewhile

2D Bar Code Structure (e.g. PDF-417)

FIG. 16

FIG. 17A1

FIG. 17A2

200,
230,
260,
270,
290

320

327B

328

329

VOLTAGE
REGULATOR

330

AUTO POWER
CONTROL
CIRCUIT

326

335

SYSTEM
OVERRIDE
SIGNAL
PRODUCING
MEANS

302

RC NETWORK

FIG. 17A3

POWER DISTRIBUTION CIRCUITRY — 325

RC NETWORK — 305

RC NETWORK — 312

C_3/C_1 — 2

DATA TRANSMISSION SWITCH — 303

SCAN ENGINE — 300

HOST DEVICE, I.E. COMPUTER, PDT, ECR, ECT. — 441

$E_9=1$

DATA TRANSMISSION STATE INDICATOR — 454

FIG. 17A4

320

328   327B

329

VOLTAGE
REGULATOR

330

$V_{BATTERY}$

330A

DC - DC
CONV.

C_1 R_3

R_1

330C1

V_{REF} +

−

330B

R_4

330C

R_2

R_5

LOW LEVEL
VOLTAGE
DETECTION
CIRCUIT

LED

3000

330C2

R

A_3 = 1
"GOOD
READ
SIGNAL"

R

326   325

POWER
DISTRIBUTION
CIRCUITRY

330D

650

MODE-
SELECT
SENSOR

551B
(MAGNET)
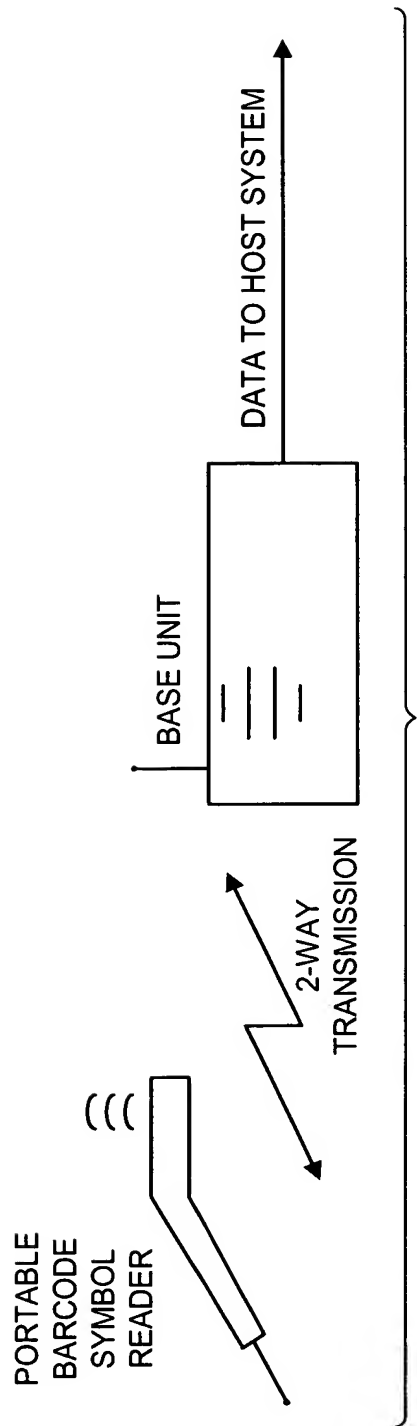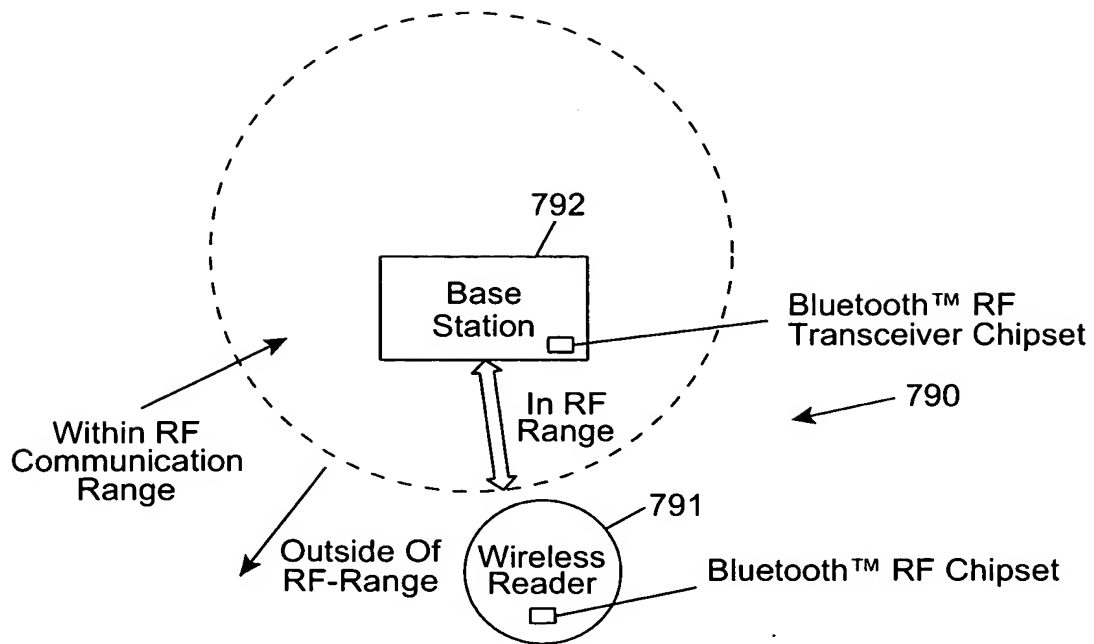
FIG. 17B

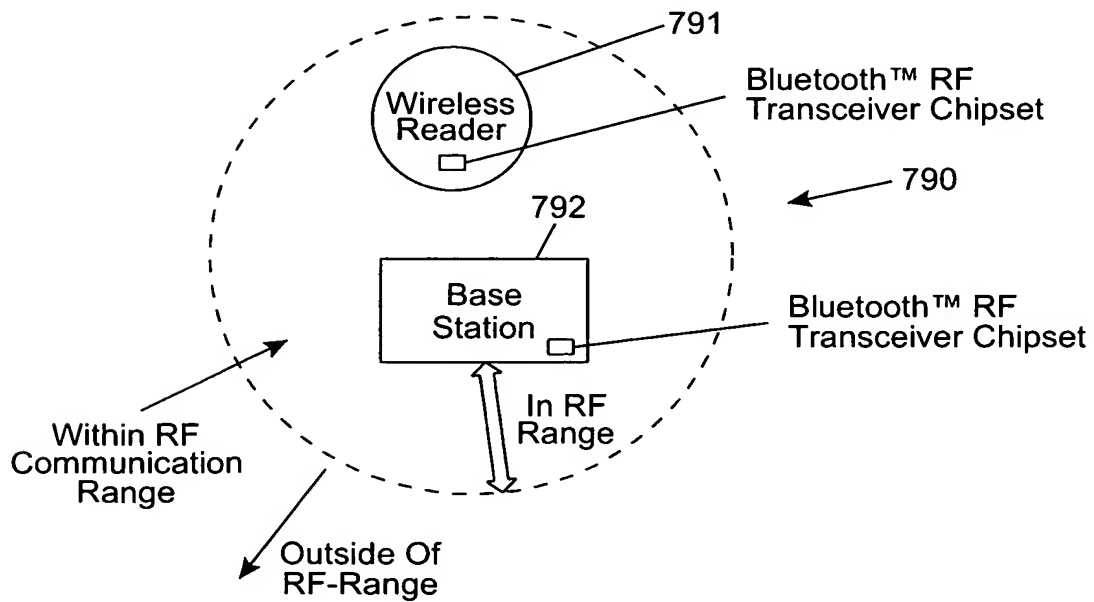## PDF DATA PACKET TRANSMISSION VIA 2-WAY RF WITH AUTOMATIC RF-RANGE DEPENDENT CONTROL (2-D READING MODE)
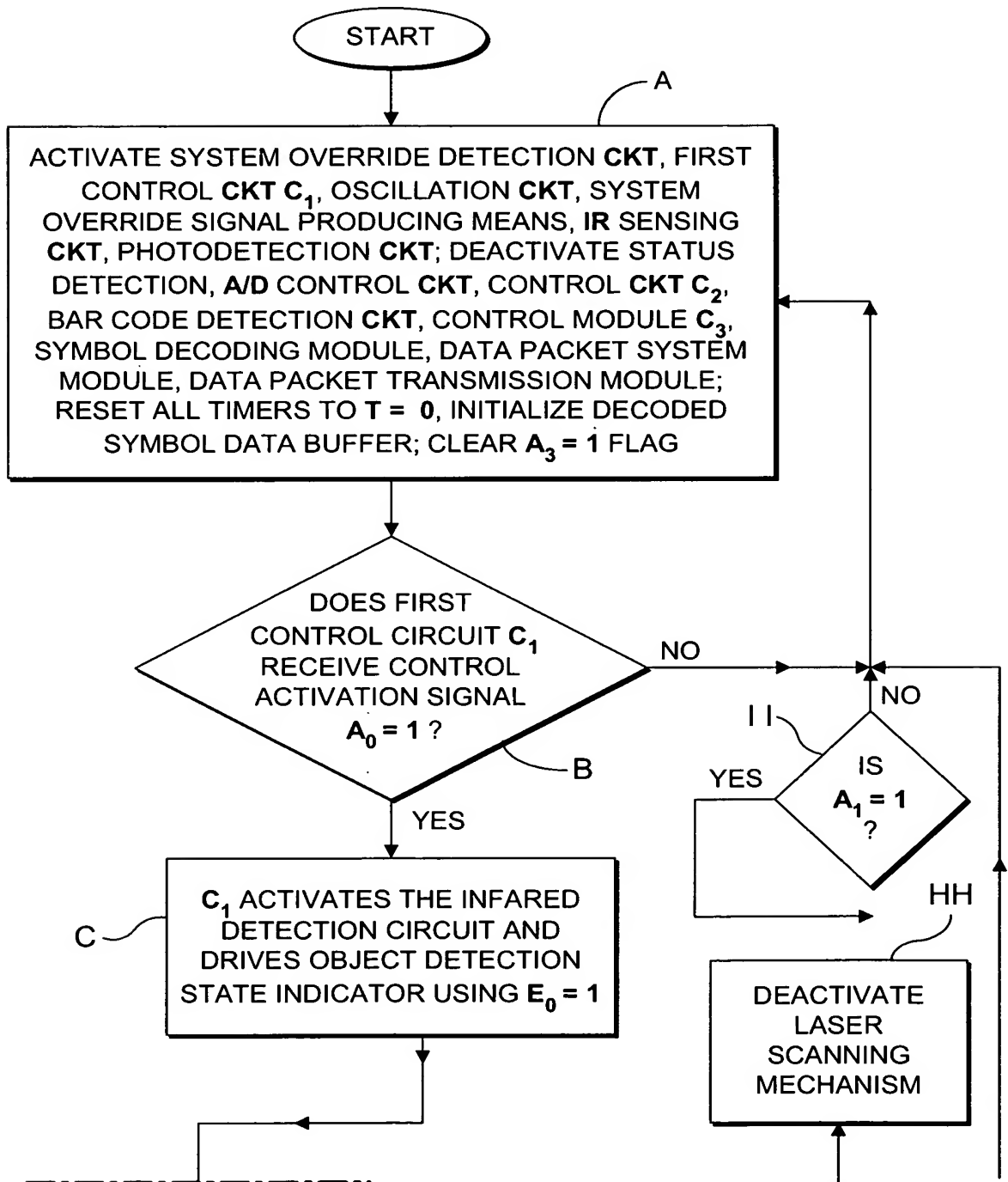
START

A

ACTIVATE SYSTEM OVERRIDE DETECTION **CKT**, FIRST CONTROL **CKT** C_1, OSCILLATION **CKT**, SYSTEM OVERRIDE SIGNAL PRODUCING MEANS, **IR** SENSING **CKT**, PHOTODETECTION **CKT**; DEACTIVATE STATUS DETECTION, **A/D** CONTROL **CKT**, CONTROL **CKT** C_2, BAR CODE DATA DETECTION **CKT**, CONTROL MODULE C_3, SYMBOL DECODING MODULE, DATA PACKET SYSTEM MODULE, DATA PACKET TRANSMISSION MODULE; RESET ALL TIMERS TO **T = 0**, INITIALIZE DECODED SYMBOL DATA BUFFER; CLEAR $A_3 = 1$ FLAG

DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_0 = 1$?

NO

B

YES

C_1 ACTIVATES THE INFARED DETECTION CIRCUIT AND DRIVES OBJECT DETECTION STATE INDICATOR USING $E_0 = 1$

C

NO

I I

YES

IS $A_1 = 1$?

HH

DEACTIVATE LASER SCANNING MECHANISM

F I G. 18A1

D DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_1 = 1$ INDICATING AN OBJECT IS DETECTED ?

NO

E DOES FIRST CONTROL CIRCUIT C_1 RECEIVE CONTROL ACTIVATION SIGNAL $A_0 = 1$?

YES

NO

⑨

YES

F C_1 DEACTIVATES **IR** DETECTION CIRCUIT, **IR** TRANSMITTER, AND **IR** RECEIVER USING E_0; C_1 ALSO ACTIVATES SCANNING CIRCUIT, PHOTO-RECEIVING CIRCUIT, AND **A/D** CONVERSION CIRCUIT USING E_1, BARCODE SYMBOL DATA DETECTION CIRCUIT USING E_2; AND STARTS TIMER T_1; AND DRIVES BAR CODE DETECTION STATE INDICATOR USING $E_2 = 1$

G DOES SECOND CONTROL CIRCUIT C_2 RECEIVE CONTROL ACTIVATION SIGNAL $A_2 = 1$ INDICATING A BARCODE IS DETECTED WITHIN T_1 ?

NO

③

H IS $A_3 = 1$ FLAG SET TO "TRUE" ?

NO

I SET DATA IN SYMBOL DECODED DATA BUFFER TO ZERO

YES

YES

②

①

FIG. 18A2

②   ①

J — C_2 ACTIVATES THIRD CONTROL CIRCUIT C_3 USING E_3;
C_2 ALSO RESETS TIMER T_1, $0 \leq T_1 \leq 1.0$ sec

K — C_3 ACTIVATES THE SYMBOL
DECODING MODULE USING E_4;
RESETS AND RESTARTS TIMER
T_2, $0 < T_2 < 1$ sec; AND STARTS
TIMER T_3, $0 < T_3 < 5$ sec.

NO →   N
DOES
THIRD CONTROL
CIRCUIT C_3 DETECT TIME   YES →
ELAPSED ON TIMER
$T_3 > 5$ sec
?

YES

L   ④   M   ③

DOES   NO   DOES
CONTROL MODULE   CONTROL MODULE
C_3 RECEIVE CONTROL C_3 RECEIVE CONTROL   NO →
ACTIVATION SIGNAL   ACTIVATION
$A_3 = 1$ WITHIN T_2 SIGNAL $A_2 = 1$?
?

YES

SET $A_3 = 1$ FLAG TO TRUE AND GENERATE
ENABLE SIGNAL E_8 TO DRIVE BAR CODE
READ STATE INDICATOR

O

IS ELAPSED
TIME ON TIMER $T_3 > 5.0$ YES
SECONDS ?

P

NO

DOES   Q
CONTROL
MODULE C_3 RECEIVE   NO →   SET DATA IN   R
CONTROL ACTIVATION   SYMBOL
SIGNAL $A_4 = 1$ WITHIN   DECODED DATA
60ms?   BUFFER TO ZERO

YES

⑤   FIG. 18B

FIG. 18C1

(7)

↓

THIRD CONTROL CIRCUIT C_3 CONTINUES ACTIVATION OF LASER DIODE, SCANNING MOTOR, PHOTORECEIVING CIRCUIT, **A/D** CONVERSION CIRCUIT; DEACTIVATES SYMBOL DECODING MODULE; AND COMMENCES ACTIVATION DATA PACKET SYNTHESIS MODULE — W

↓

UNDER C_3 CONTROL DATA PACKET SYNTHESIS MODULE CONSTRUCTS DATA PACKET CONSISTING OF SYMBOL CHARACTER DATA, TRANSMITTER NUMBER, DATA PACKET GROUP NUMBER, CHECK CHARACTER AND FRAMING CHARACTERS — X

↓

IS IN-RF RANGE CONFIRMATION SIGNAL $A_5=1$? — Y —— NO → (10)

YES ↓

ARE DATA PACKET GROUP(S) STORED IN DATA PACKET GROUP BUFFER? — Z — NO →

YES ↓

C_3 CONTROL MODULE GENERATES ENABLE SIGNAL $E_{11}=1$ RELOADING BUFFERED DATA PACKET GROUPS INTO DATA PACKET TRANSMISSION CIRCUIT — AA

↓

CONTROL MODULE C_3 GENERATES ENABLE SIGNAL $E_{11}=1$ LOADING CURRENTLY SYNTHESIZES DATA PACKET GROUP INTO DATA PACKET TRANSMISSION CIRCUIT — BB

↓

(11)

FIG. 18C2

(11)

C_3 ACTIVATES DATA PACKET TRANSMISSION CIRCUIT ⎯CC

UNDER C_3 CONTROL DATA PACKET SYNTHESIS MODULE OUTPUTS PACKETS TO DATA PACKET TRANSMISSION CIRCUIT FOR TRANSMISSION TO BASE STATION ⎯DD

DATA PACKET TRANSMISSION CIRCUIT RECEIVES A PACKET GROUP ACKNOWLEDGEMENT SIGNAL FROM BASE STATION WHEN BASE STATION RECEIVES ALL PACKETS IN EACH DATA PACKET GROUP SENT ⎯EE

C_3 CONTROL MODULE GENERATES AUDIBLE BEEP SOUND (AND GOOD READ VISUAL-INDICATION) FOR EACH DATA PACKET GROUP SENT TO BASE STATION SUCCESSFULLY ⎯FF

(8)

FIG. 18C3

⑧

GG

C_3 CONTINUES ACTIVATION OF SCANNING CIRCUIT, PHOTO-RECEIVING CIRCUIT USING C_3/C_1 OVERRIDE; DEACTIVATES SYMBOL DECODING MODULE USING E_4; DEACTIVATES THE DATA PACKET SYNTHESIS MODULE, DATA STORAGE UNIT, AND DATA TRANSMISSION CIRCUIT USING E_5, E_6 AND E_7 RESPECTIVELY; AND DISABLES DATA TRANSMISSION STATE INDICATOR USING $E_9=0$

HH

DOES THIRD CONTROL CIRCUIT C_3 CONTINUE TO RECEIVE CONTROL ACTIVATION SIGNAL $A_1=1$ INDICATING AN OBJECT IS PRESENT?

NO ①

YES

II

CONTROL MODULE C_3 REACTIVATES BAR CODE PRESENCE DETECTION CIRCUIT USING C_3/C_2 OVERRIDE, RESETS AND RESTARTS TIMER T_4, $0 < T_4 < 3$ sec. AND STARTS TIMER T_3, $0 < T_3 < 5$ sec.

⑨

FIG. 18C4